



## **NASA STTR 2016 Phase I Solicitation**

### **T7.01 Synthetic/Engineering Biology for NASA Applications**

**Lead Center: ARC**

Synthetic Biology (SB) provides a unique opportunity to engineer organisms that reliably perform necessary functions for future exploration activities. NASA is interested in harnessing this emerging field to create technological advances that will benefit both future spaceflight and surface missions in a variety of enabling areas. Proposals must use a biologically-based approach, such as synthetic biology, to engineer novel biologically-based (or inspired) functions that significantly exceed current biological capabilities. Proposed projects should focus on using microorganisms in novel ways that enable ISRU, with a particular focus on resource acquisition and/or utilization or feedstock production to enable ISM. NASA's ISM program has the desire to be able to manufacture materials, parts and/or structures utilizing feedstock generated from renewable biology-based resources. Available in-situ resources may include crew and spacecraft by-products or resources found on planetary surfaces. Products of interest might include, but are not limited to, various metals, bioplastics, biocements, and other biomaterials. Applications that concurrently support more reliable and efficient life support systems during the acquisition and utilization of in-situ resources or the production of feedstock are highly desirable. Proposals should address how systems and technologies will reduce the required launch-mass and dependence on consumables, resupply, and energy and should identify how such technologies provide advantages over physico-chemical systems. The Phase I STTR deliverable should include a Final Report that captures any scientific results and processes as well as details on the technology identified. The Final Report should also include a Feasibility Study which defines the current technology readiness level and proposes the maturation path for further evolution of the system. Opportunities for commercial and government infusion should be addressed. There is strong potential for the Phase I effort continuing to a Phase II STTR demonstration to compare ground to microgravity data (obtained via parabolic and/or ISS flight demonstration).